

Air Monitoring Update: PM_{2.5} and Ozone



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Overview

- New Jersey Air Monitoring Network
- Ozone Update and Trends
- Fine Particles ($PM_{2.5}$) Update & Trends
- Air Toxics Update
- $PM_{2.5}$ Composition

Air Monitoring Network

- Criteria Air Pollutants
- Ozone Precursors (VOCs)
- Air Toxics
- Acid Precipitation
- Visibility
- Meteorological Measurements

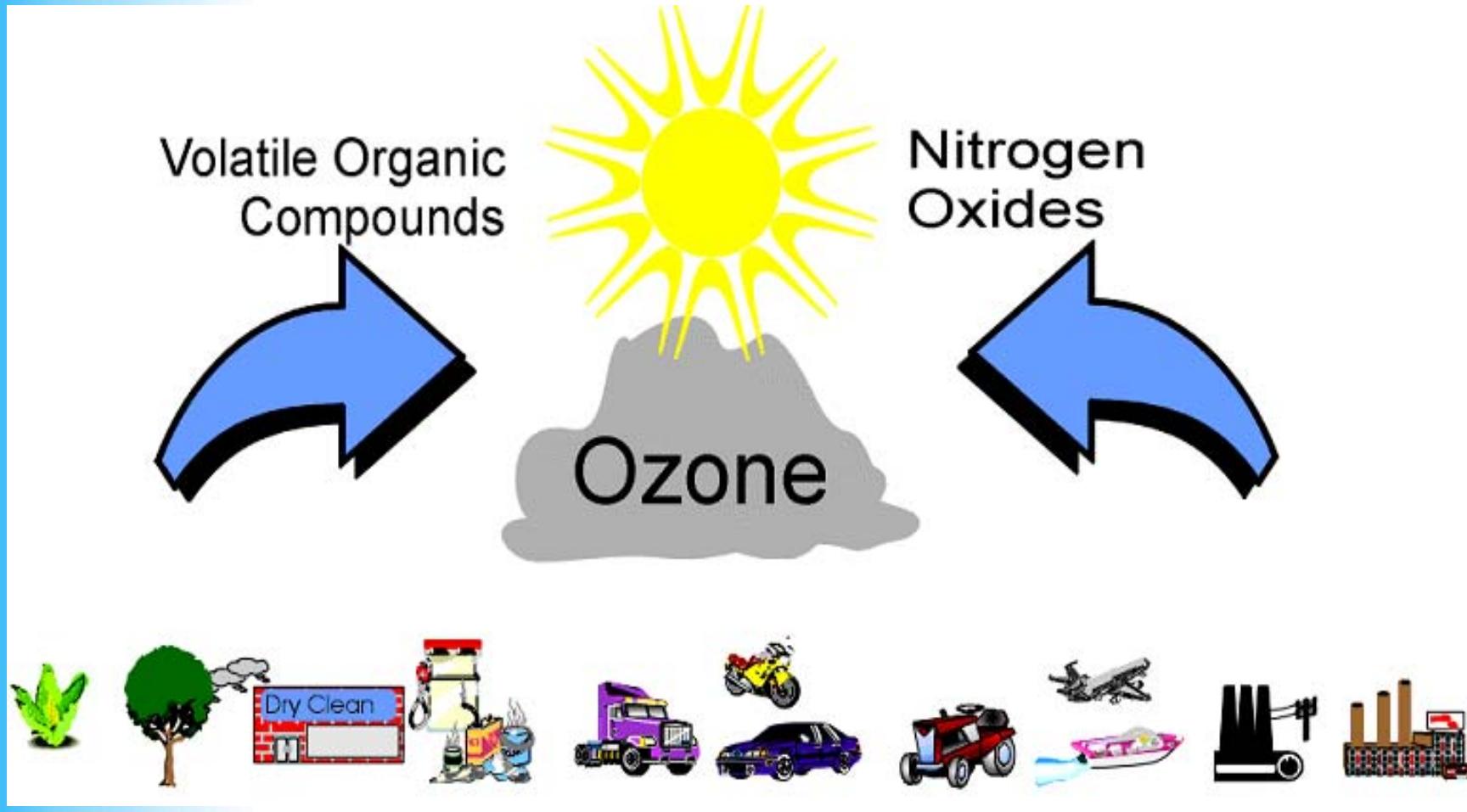
National Ambient Air Quality Standards (NAAQS)

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Ozone
- Particulate Matter
 - Fine ($PM_{2.5}$)
 - Inhalable (PM_{10})
- Sulfur Dioxide
- Primary Standard
 - health based
- Secondary Standard
 - welfare based
- Concentration
 - specific time average
 - multiple year average

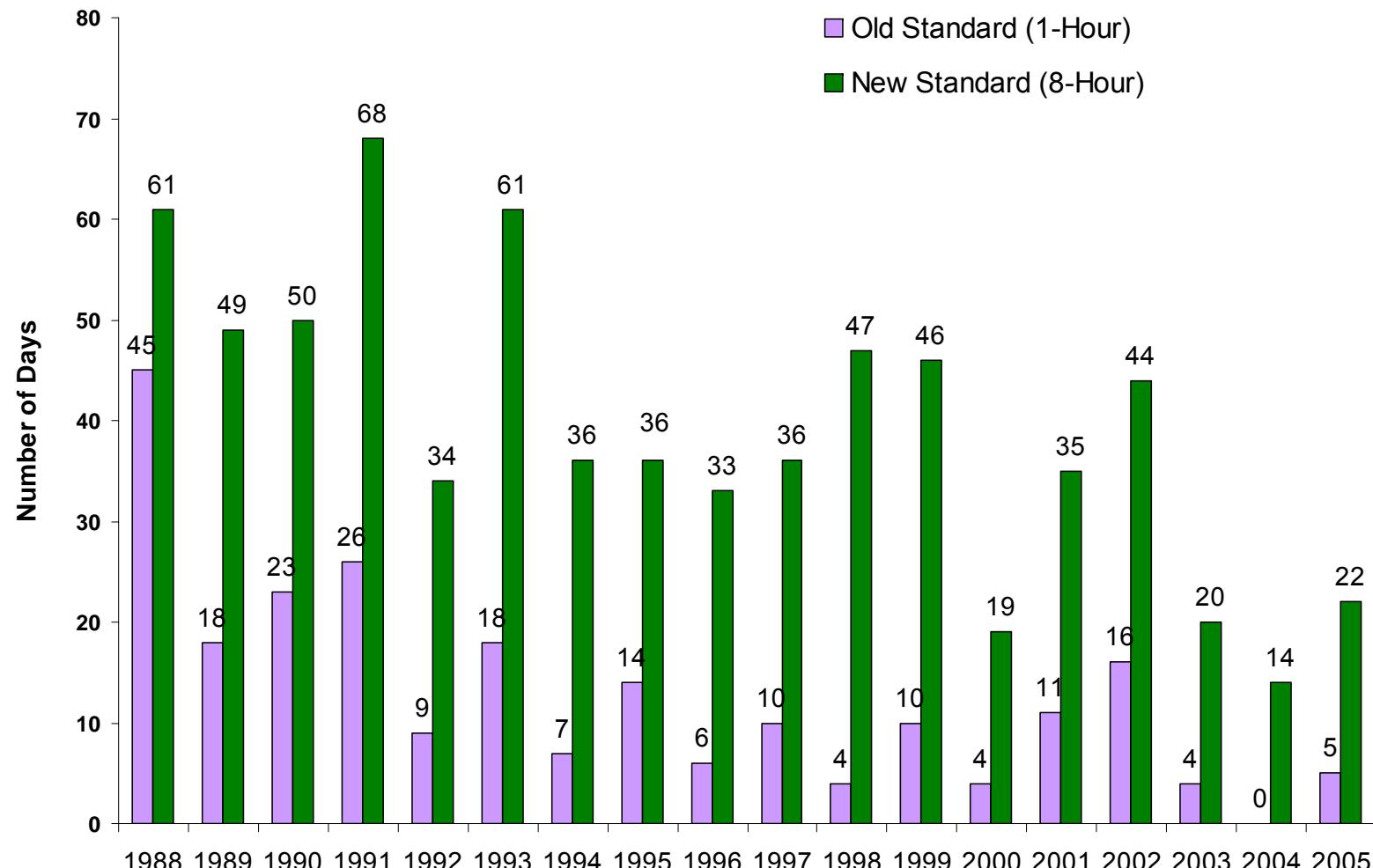
Ozone Monitoring Network



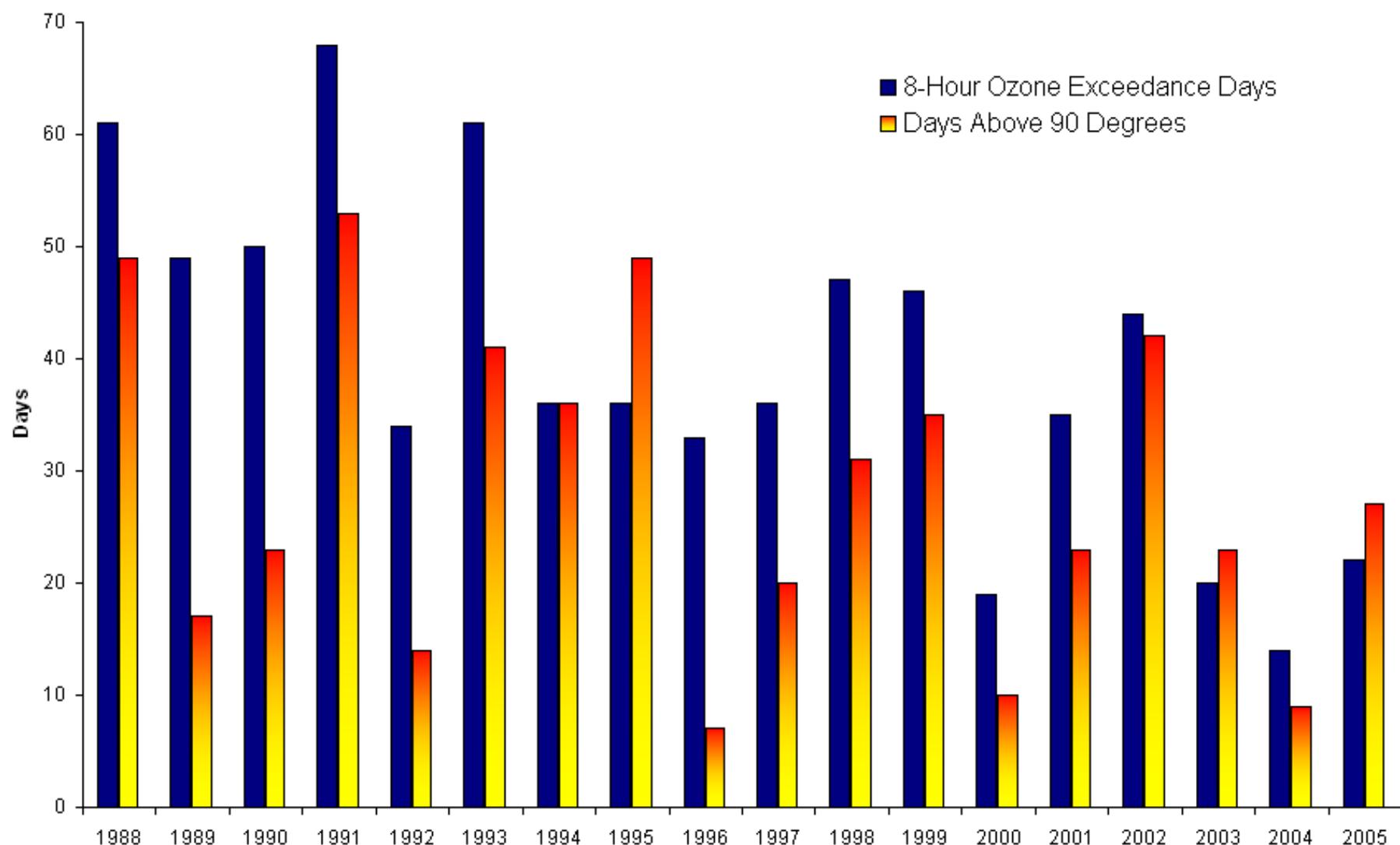
How Ground Level Ozone is Formed



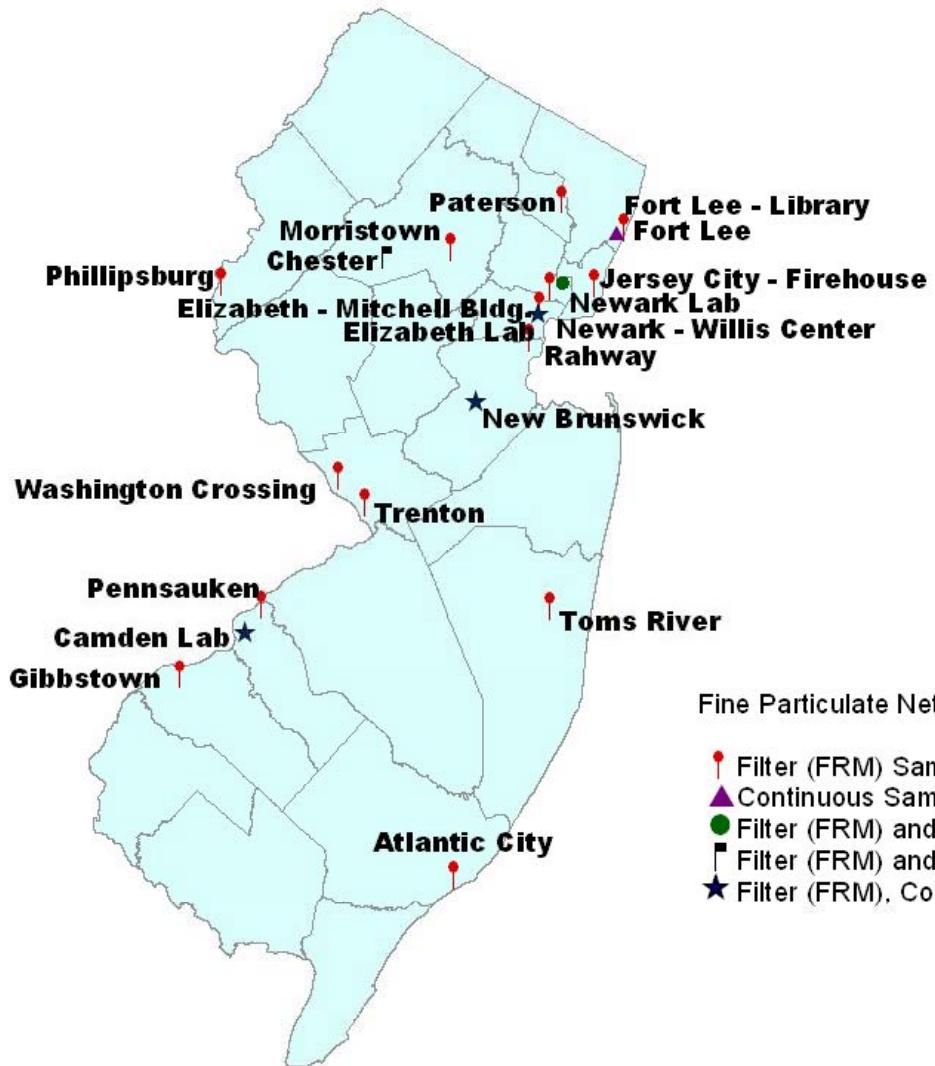
Days on Which the Old and New Ozone Standards Have Been Exceeded in New Jersey 1988 - 2005



**Number of Days 8-Hour Ozone Standard was Exceeded and
Number of Days Above 90 Degrees in New Jersey 1988 - 2005**



New Jersey Fine Particle (PM_{2.5}) Monitoring Network



Sources of PM_{2.5}

Primary Particles

Combustion of fossil fuels

Construction / Agricultural

Wild fires

Secondary Particles

SO₂

NO_x

VOC

PM_{2.5} Measurement

- Federal Reference Method (FRM)
 - approved sampler
 - collected on filters
 - weighed in lab
 - 24-hour average concentration
 - compared to NAAQS
- Continuous Analyzer
Real-time values 24/7
Air Quality Index
TEOM in NJ
Not FRM
- Speciation Sampler
composition of PM
collected on filters
Not FRM

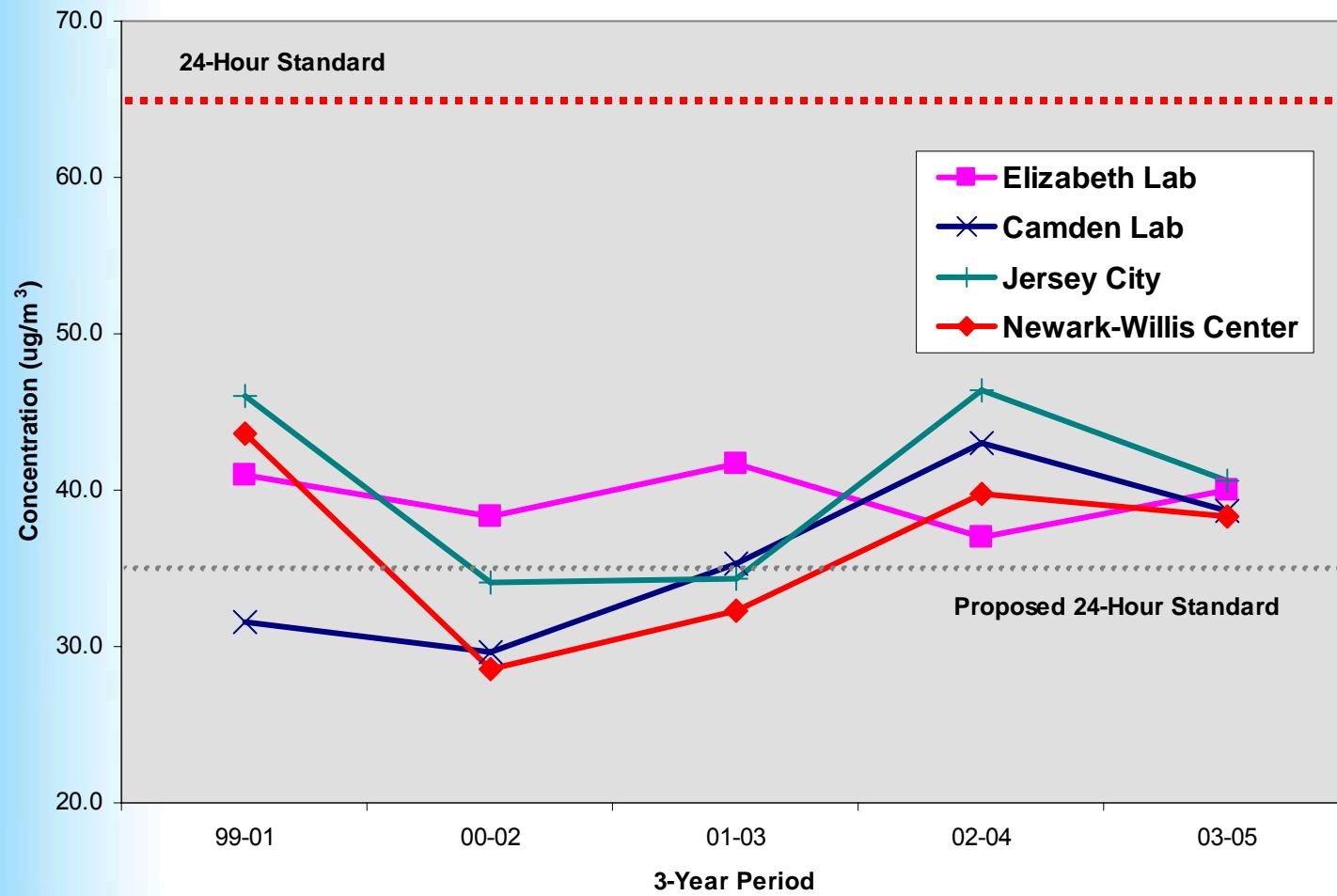
PM_{2.5} PRIMARY AND SECONDARY STANDARDS

	Current	Proposed
Annual ^a	15.0 µg/m ³	15.0 µg/m ³
24-Hour ^b	65 µg/m ³	35 µg/m ³

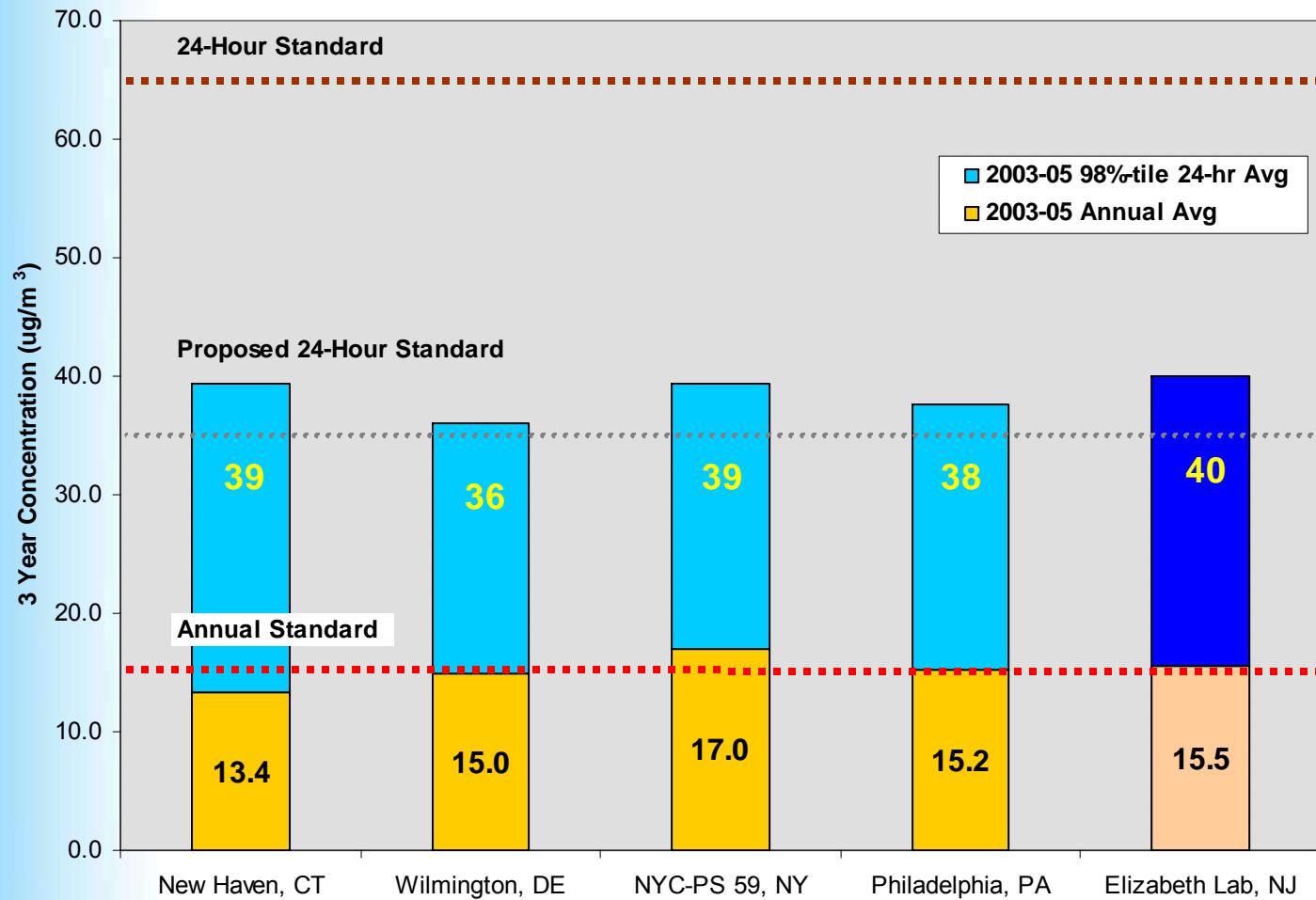
^a3-Year (Consecutive, 100% Valid Quarters) Annual Average

^b3-Year Average 98th Percentile 24-Hour Average

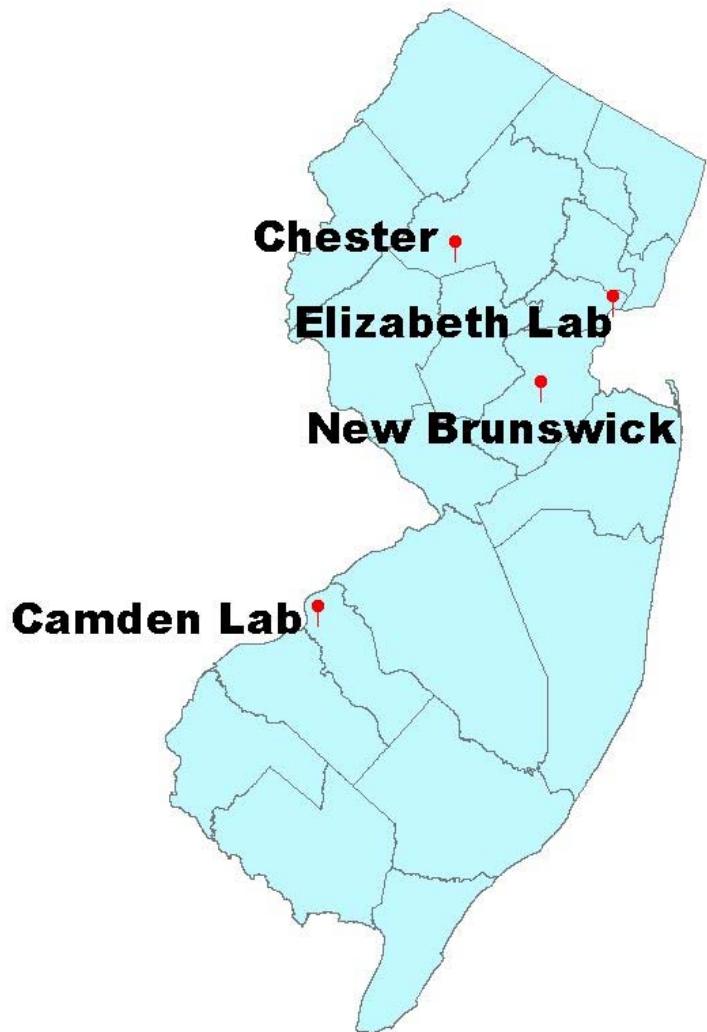
Trend in 3-Year 98th Percentile 24-Hour PM_{2.5} Averages at NJ Sites with Highest 98th Percentiles 1999-2005



Comparison of PM_{2.5} Concentrations in CT, DE, NY, PA and New Jersey with NAAQS for 2003-2005



New Jersey Speciated Trends Network (STN)



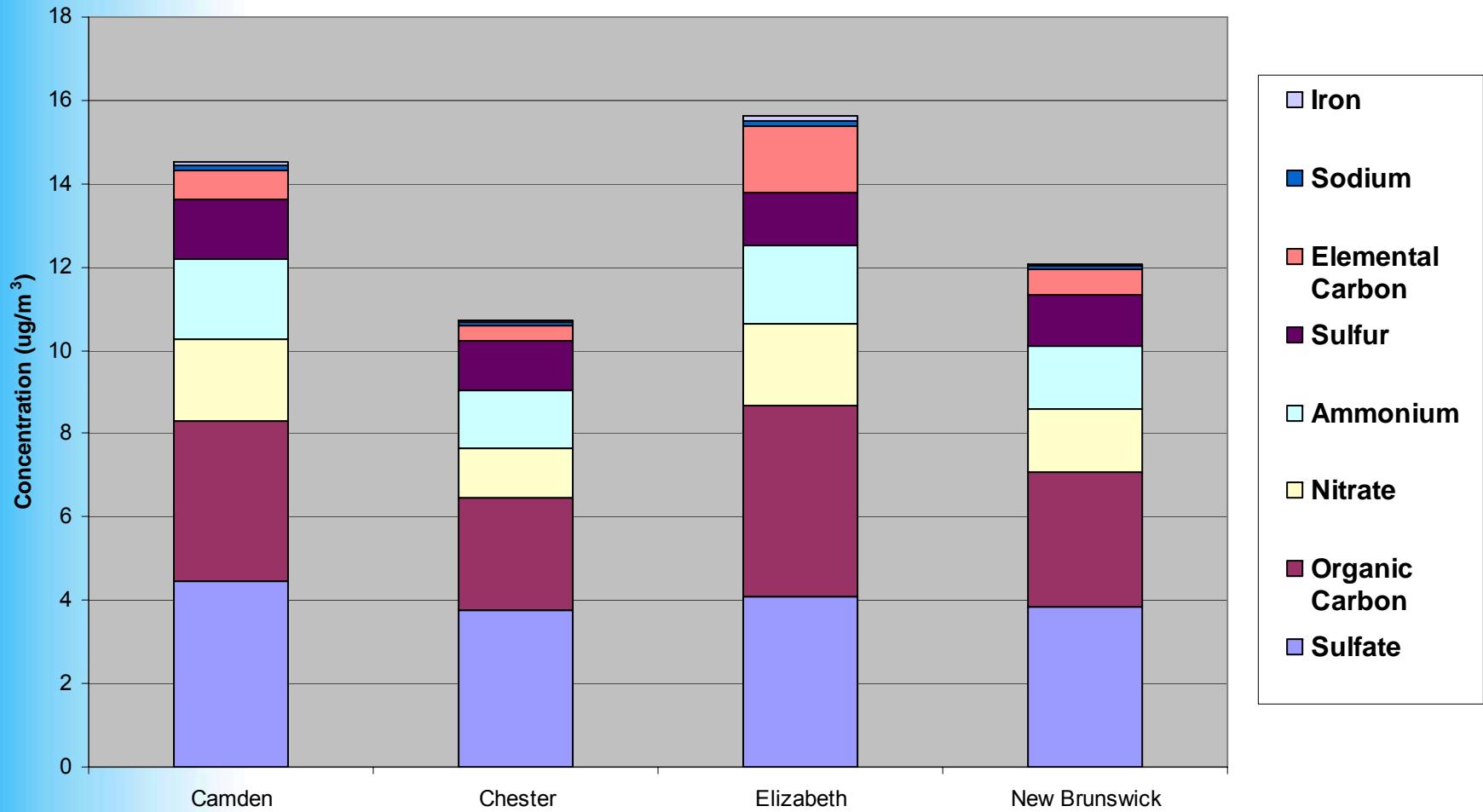
Major Components of PM_{2.5}

- Soils
- Elemental Carbon
- Organic Carbon
- Ammonium Nitrate
- Ammonium Sulfate

Minor Components

- Trace Metals

New Jersey 2005 PM_{2.5} Speciation Data



Visibility Impairment

- Caused by Particles
- Light Scattering
 - Soils
 - Nitrates
 - Organic Carbon
 - Sulfates
- Light Absorption
 - Elemental Carbon
- Regional Haze Network
 - IMPROVE
 - CAMNET



Brigantine, NJ

“Good Visibility”

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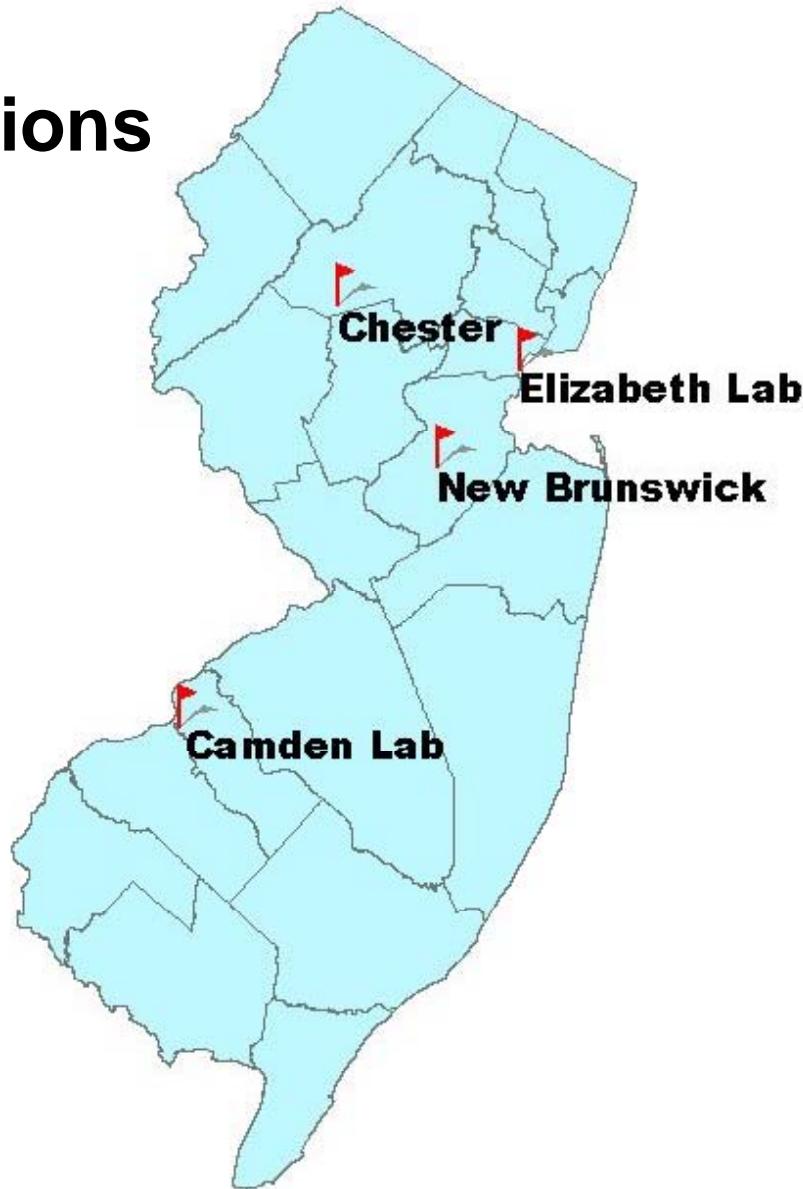
Brigantine, NJ

“Poor Visibility”



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New Jersey Air Toxics Monitoring Stations



Air Toxics/Speciation Network

- 70 VOCs
- 48 Trace Elements
- 5 Ionic Species
- 3 Carbon Species
- Mercury
- Whole Air
- Adsorbent
- Filters
 - Teflon
 - Nylon
 - Quartz
- Gold Film

Air Toxics of Concern Statewide in New Jersey

<http://www.state.nj.us/dep/airmon/airtoxics/nataest.htm>

Pollutant of Concern

Benzene
1,3-Butadiene
Carbon tetrachloride
Chloroform
Diesel particulate matter
Ethylene dibromide
Ethylene dichloride
Formaldehyde

Primary Source of Emissions

Background Concentration
Onroad Mobile
Background Concentration
Background Concentration; Point
Nonroad Mobile
Background Concentration
Background Concentration
Mobile

Summary

- PM_{2.5}
 - Do not meet Annual PM_{2.5} NAAQS at Elizabeth Lab
 - Meet current 24-hour PM_{2.5} NAAQS statewide
 - Do not meet proposed 24-hour PM_{2.5} NAAQS at 12/19 sites
- Ozone
 - Do not meet 8-hour Ozone NAAQS